

In The Claims:

1. (Previously Presented) A drop filter comprising:
a holographic filter;
a quasi phase-conjugate optical system comprising a lens and a mirror and optically coupled to said holographic filter;
an input optical fiber collimator;
a drop optical fiber collimator;
a through optical fiber collimator; and
a free-space circulator optically coupled to said input optical fiber collimator, said drop optical fiber collimator, and said holographic of said drop filter.
2. (Currently Amended) The drop filter of claim 1 wherein said holographic filter [[material]] is tunable.
3. (Currently Amended) The drop filter of claim 1 wherein said holographic filter [[material]] can rotate.
4. Canceled.
5. (Currently Amended) The drop filter of claim 1 wherein said input optical fiber collimator [[fiber optic source]] is fed with a plurality of wavelength division multiplexed channels of light.
6. (Currently Amended) The drop filter of claim [[1]] 5 wherein [[said]] light from said plurality of wavelength division multiplexed channels further comprises:
collimating said light;

passing said light through said holographic filter material; and
diffracting only one of said wavelength division multiplexed channels.

7. Canceled.

8. (Previously Presented) The drop filter of claim 1 wherein focal length of said lens generates a quasi phase-conjugate diffracted beam of light.

9. (Currently Amended) The drop filter of claim 8 wherein said diffracted beam of light is reflected back into said optical fiber collimator via said holographic filter material.

10. (Currently Amended) The drop filter of claim ~~[[1]]~~ 9 wherein focal length of said lens causes said diffracted beam of light to retrace its path towards said holographic filter ~~[[material]]~~ regardless of the orientation of said diffracted beam of light and said holographic filter ~~[[material]]~~.

11. (Currently Amended) The drop filter of claim ~~[[10]]~~ 8 wherein said diffracted beam of light is Bragg matched to said holographic filter ~~[[material]]~~.

12. (Currently Amended) The drop filter of claim 11 wherein said Bragg matching forces said diffracted beam of light to follow a path identical to [[the original incident beam of light]] one of said plurality of wavelength division multiplexed channels of light from said input optical fiber collimator.

13. (Currently Amended) The drop filter of claim 12 wherein said diffracted beam of light is in ~~[[an opposite]]~~ direction as ~~[[the original incident beam of light]]~~ as

one of said plurality of wavelength division multiplexed channels of light from said input optical fiber collimator.

14. (Currently Amended) The drop filter of claim [[1]] 13 wherein said free-space circulator directs said diffracted beam of light to [[an]] a drop optical fiber collimator.

15. Canceled.

16. (Currently Amended) A filter system comprising:
a first fiber optic collimator;
a free space circulator coupled to said first fiber optic collimator;
a first mirror coupled to said free space circulator;
a holographic drop filter coupled to said first mirror to diffract at least one of a plurality of WDM channels to an optical system,
said optical system coupled to said holographic drop filter to redirect [[said]] at least one of said plurality of WDM channels back into said holographic drop filter;
a drop fiber optic collimator coupled to said free space circulator that collects [[said]] at least one of plurality of WDM channels redirected into said holographic drop filter by said optical system.

17. (Previously Presented) The filter system of claim 16 wherein said holographic drop filter is tunable.

18. (Currently Amended) The filter system of claim 17 [[wherein said filter system]] is tuned by rotating said holographic drop filter such that its effective period length is altered.

19. (Currently Amended) The filter system of claim 16 wherein a diffraction of [[said]] at least one of said plurality of WDM channels to said optical system depends on an orientation of said holographic drop filter.

20. (Previously Presented) The filter system of claim 16 wherein said holographic drop filter has a refractive index that can be altered by an external electric field.

21. (Previously Presented) The filter system of claim 20 wherein said refractive index is between 1.35 and 1.45.

22. (Previously Presented) The filter system of claim 16 wherein said holographic drop filter is made from a photorefractive crystal.

23. (Currently Amended) A filter system comprising:
a first fiber optic collimator;
a free space circulator coupled to said first fiber optic collimator;
a first mirror coupled to said free space circulator;
a holographic drop filter coupled to said first mirror to diffract at least one of a plurality of WDM channels to an optical system and pass through a remainder of said plurality of WDM channels;
said optical system further comprising a lens and a second mirror coupled to each other;
said optical system coupled to said holographic drop filter redirects [[said]] at least one of said plurality of WDM channels back into said holographic drop filter;
a second fiber optic collimator coupled to said holographic drop filter that collects said remainder of said plurality of WDM channels that pass through said holographic drop filter; and

a third fiber optic collimator coupled to said free space circulator that collects [[said]] one of plurality of WDM channels redirected into said holographic drop filter by said optical system.

24. (Previously Presented) The filter system of claim 23 wherein said holographic drop filter is tunable.

25. (Previously Presented) The filter system of claim 24 wherein said filter system is tuned by rotating said holographic drop filter such that its effective period length is altered.

26. (Previously Presented) The filter system of claim 23 wherein diffraction of said at least one of said plurality of WDM channels to said optical system depends on said holographic drop filter's orientation.

27. (Previously Presented) The filter system of claim 26 wherein said second mirror is positioned at a focal length of said lens such that said quasi phase-conjugate diffracted channel is in a direction opposite to said one of plurality of WDM channels diffracted to said optical system.

28. (Previously Presented) The filter system of claim 26 wherein said holographic drop filter has a refractive index that can be altered by an external electric field.

29. (Previously Presented) The filter system of claim 28 wherein said refractive index is between 1.35 and 1.45.

30. (Previously Presented) The filter system of claim 26 wherein said holographic drop filter is made from a photorefractive crystal.

31. (Currently Amended) A method to tune a filter comprising the steps of:
collimating a plurality of WDM channels by a first fiber optic collimator;
coupling a free space circulator to said first fiber optic collimator;
coupling a first mirror to said free space circulator;
diffracting to an optical system coupled to [[said]] a holographic drop filter one of [[said]] a plurality of WDM channels by [[a]] said holographic drop filter coupled to said first mirror;
passing through said holographic drop filter rest of said plurality of WDM channels;
redirecting said diffracted one of plurality of WDM channels back into said holographic drop filter by said optical system; .
coupling a second fiber optic collimator to said holographic drop filter to collect rest of said plurality of WDM channels that pass through said holographic drop filter; and
coupling a third fiber optic collimator to said free space circulator to collect said one of plurality of WDM channels redirected into said holographic drop filter by said optical system.

32. (Previously Presented) The method of claim 31 further comprising tuning of said holographic drop filter.

33. (Previously Presented) The method of claim 31 wherein tuning of said filter system is done by rotating said holographic drop filter such that its effective period length is altered.

34. (Previously Presented) The method of claim 31 wherein diffracting to said optical system one of said plurality of WDM channels depends on said holographic drop filter's orientation.